

Notice of Allowability

Application No.

09/917,139

Examiner

Zia R. Hashmi

Applicant(s)

OZKAN ET AL.

Art Unit

2881

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 12/9/2004.
2. ☒ The allowed claim(s) is/are 1-17, 19-21, 23, 24, 26-29 and 33-39.
3. ☒ The drawings filed on 26 July 2001 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date 8/12/04 & 1/4/05
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____.
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

DETAILED ACTION

Allowable Subject Matter

1. An "Amendment" was received on December 9, 2004 in response to Office Action of August 9, 2004. Claims 18, 22, 25, and 30-32 have been canceled, new claims 34-39 have been added, claims 8-10, 16-17, 20-21, 23-24, 26-27, and 29 have been amended, and changes to the specification have been made, as indicated.
2. Claims 1-7, 19-21, 23, 24, 26-29, and 33-39 are allowed.
3. The following is an examiner's statement of reasons for allowance:
4. With respect to independent claims 1 and 9, prior art fails to disclose optical tweezers (optical trapping and transport of fine particles based on radiation pressure) using laser light comprising at least one Vertical Cavity Surface Emitting Laser (VCSEL), or a method of optically trapping and tweezing comprising optically spatially manipulating at least one object illuminated by laser light of a VCSEL.
5. With respect to independent claims 17, 21, and 24, prior art fails to disclose an optical tweezer or plurality of optical tweezers comprising a stage supporting an object or a plurality of optically manipulatable objects, a single or plurality of VCSELs which are independently intensity controllable, respectively originating a single or a plurality of laser light beams for concurrently optically manipulating single or plurality of objects supported upon the stage, thereby enhancing the optical force imparted to the object over that which would be imparted by a single laser beam.
6. With respect to independent claims 27 and 29, prior art further fails to disclose

optical tweezers comprising: two electrodes, at least one of which is optically transparent, holding between them at least one object suitably manipulatable both by (i) an electric field between the two electrodes and, also, (ii) an impinging laser light beam; and a VCSEL with a Laguerre-Gaussian energy distribution, to produce a laser beam passing through the at least one electrode that is transparent to impinge upon the at least one object so as to optically manipulate this at least one object; wherein the at least one object is susceptible of manipulation by both electrical and optical forces.

Claims 2-8,10-16, 19-20, 23, 26, 28, and 33-39 are allowed by virtue of their dependencies on the independent claims 1, 9, 17, 21, 24, 27, and 29.

Conclusion

7. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments of Statement of Reasons for Allowance".

8. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact Electronic Business Center (EBC) at 866-217-9197 (toll-free).

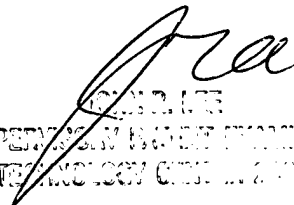
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9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Zia Hashmi whose telephone number is (571) 272-2473.

The examiner can normally be reached between 8.30 AM- 5 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John R. Lee can be reached on (571) 272-2477.

Zia Hashmi

February 2, 2005.


JOHN R. LEE
SUPERVISOR, PATENT EXAMINER
TECHNOLOGY CENTER 2